IN THE CLAIMS.

Please amend the claims to read as follows:

1-36 (Cancelled).

--37. (Currently Amended) A method of measuring twist in a rotating shaft of an engine which shaft is subjected to torque, between a datum point on the shaft and a measure point on the shaft longitudinally spaced from the datum point, the method including

establishing a datum time period between a datum time moment the datum point passes a stationary datum station and a time moment the measure point passes a stationary measure station under a no load condition and recording rotational speed of the shaft as the datum speed;

measuring a measure time period between a time moment the datum point passes the stationary datum station and a time moment the measure point passes the stationary measure station when the shaft is subjected to torque, recording the rotational speed of the shaft as the measure speed and establishing a length of the shaft over which torque is applied;

calculating the twist in the shaft on the basis of the difference between the measure time period and the datum time period, the measure speed and the length over which torque is applied, including ameliorating the effects of vibrations and resonances in rotating or reciprocating components of the engine to isolate at least to a degree data relating to said difference between the measure time period and the datum time period, said measure speed and said length over which torque is applied, by means of a preprogrammed processor.--

--38. (Previously Presented) A method as claimed in Claim 37 in which a torque point at which torque is applied to the shaft and a load point at which a load is connected to the shaft are longitudinally spaced, the shaft being stressed and undergoing twist between the torque point and the load point, one of the measure point and the datum point being positioned along a stressed portion of the shaft, the other of the measure point and the datum point being positioned in a relaxed portion of the shaft between one of the torque point and the load point.--

--39. (Currently Amended) A method as claimed in Claim 38 in which the shaft is a crankshaft of a reciprocating internal combustion engine which includes a plurality of cylinders, a ring gear having gear teeth at an end of the crankshaft and a disc at an opposed end of the crankshaft, said measure point being provided respectively by a plurality of

measure points respectively on a corresponding plurality of gear teeth of the ring gear, said datum point being provided respectively by a plurality of datum points circumferentially spaced on said disc, the method being carried out for each power stroke of said reciprocating internal combustion engine and using the plurality of measure points and the plurality of datum points.--

--40 – 43 (Cancelled)--.

--44. (Currently Amended) A method as claimed in Claim 37 in which the shaft is a main shaft of a gas turbine engine., the method being carried out in respect of a plurality of measure points and a plurality of datum points, the plurality of measure points being on a corresponding plurality of vanes of one of the compressor and the turbine and the plurality of datum points being on a corresponding plurality of vanes of the other of the compressor and the turbine, the sensors being external of casings surrounding respectively the compressor and the turbine to cause the method to be carried out in a non-invasive manner, in which said vanes providing respectively the measure points and the datum points are masses of magnetic material and said sensors are responsive to proximity of said magnetic material to generate signals for recording respectively datum time moments and measure time moments.--

--45 – 49 (Cancelled)--

--50. (Currently Amended) A method of measuring twist in a rotating shaft of an engine which shaft is subjected to torque, the method including sensing and recording a datum time moment when a datum point on the shaft passes a fixed datum station; sensing, at a fixed measure station, an arrival time moment of a measure point on the shaft, longitudinally spaced from said datum point by a predetermined distance; measuring a measure time period between said datum time moment and said arrival time moment; measuring rotational speed of the shaft; comparing the measure time period with a computed time period under a no load condition; and calculating the twist in the shaft on the basis of the time lag and the rotational speed including ameliorating the effects of vibrations and resonances in rotating or reciprocating components of the engine to isolate at least to a degree data relating to said measure time period, and said rotational speed, by means of a pre-programmed processor.--

--51. (Cancelled).--

--52. (Currently Amended) A measuring apparatus for measuring twist in a rotating shaft of an engine which shaft is subjected to torque, the measuring apparatus including

at least one datum trigger at a datum point on the shaft;

a datum sensor at a stationary datum station arranged to sense said at least one datum trigger when said at least one datum point is in register with the datum station and to generate correspondingly at least one datum signal;

at least one measure trigger at correspondingly at least one measure point on the shaft longitudinally spaced from said at least one datum point;

a measure sensor at a stationary measure station arranged to sense said at least one measure trigger when said at least one measure trigger is in register with the measure station and to generate correspondingly at least on measure signal;

a clock keeping time;

a rotational speed meter for measuring and recording rotational speeds of the shaft against time respectively as the datum speed and as the measure speed;

recording means for recording said datum and measure signals against time;

a processor programmed to establish

correspondingly at least one datum time period between a time moment said at least one datum point passes the datum station and a time moment said at least one measure point passes the measure station under no load conditions and recording the rotational speed of the shaft as the datum speed,

correspondingly at least one measure time period between a time moment said at least one datum point passes the stationary datum station and a time moment said at least one measure point passes the stationary measure station when the shaft is subjected to torque and recording the rotational speed of the shaft as the measure speed, and

the twist in the shaft on the basis of the difference between said at least one measure time period and said at least one datum time period, the measure speed and a length of the shaft over which torque is applied, the processor being pre-programmed to ameliorate the effects of vibrations and resonances in rotating or reciprocating components of the engine to isolate at least to a degree data relating to said at least one datum time period, said at least one measure time period, said datum speed of the shaft, said measure speed of the shaft, and said length of the shaft over which torque is applied.--

--53. (Previously Amended) A measuring apparatus as claimed in Claim 52 in which the shaft includes a torque point at which torque is applied to the shaft in use and a load point at which a load is connected to the shaft in use, the torque point and the load point being longitudinally spaced, the shaft, in use, being stressed and undergoing twist between the torque point and the load point, one of the or each measure point and the or each datum point being positioned along said stressed portion of the shaft, the other of the or each measure point and the or each datum point being positioned in a relaxed portion of the shaft beyond one of the torque point and the load point.--

--54. (Currently Amended) A measuring apparatus as claimed in Claim 52 in which the shaft is a crankshaft of a reciprocating internal combustion engine which includes a plurality of cylinders, a ring gear having gear teeth at an end of the crankshaft and a disc at an opposed end of the crankshaft, said measure point being provided respectively by a plurality of measure points respectively on a corresponding plurality of gear teeth of the ring gear, said datum point being provided respectively by a plurality of datum points circumferentially spaced on said disc.--

--55 and 56 (Cancelled).--

--57. (Currently Amended) A measuring apparatus as claimed in Claim 53 in which the shaft is a main shaft of a gas turbine engine the measuring apparatus including a plurality of datum points and a plurality of measure points, the datum points and the measure points being respectively on vanes of the compressor and the turbine, the respective vanes being masses of magnetic material, said datum sensor and said measure sensor being correspondingly a plurality of datum sensors and a plurality of measure sensors provided externally, in non-invasive manner, of casings of respectively said compressor and said turbine, the sensors being responsive to proximity of the respective masses of magnetic material to generate signals for recording respectively the datum time moments and the measure time moments.--

--58 – 65 (Cancelled).--

--66. (Currently Amended) A method of managing operation of an engine including measuring a quantity related to torque in a drive shaft of the engine as claimed in Claim 37,

comparing the measured value of said quantity related to torque to a predetermined standard value of said quantity, establishing any deviation between the measured value and the standard value and controlling an operating function of the engine in response to said established deviation.--

--67. (Previously Presently) A method as claimed in Claim 66 in which said operating function of the engine is at least one of ignition timing when the engine is a spark ignition engine, injector pump timing when said engine is a diesel engine, boost pressure when said engine is turbo charged or supercharged.--

--68. (Previously Presented) A method as claimed in Claim 66 including automatically calibrating the measuring apparatus in respect of datum time periods when the engine is operated under a no load condition.--

--69. (Previously Presented) An engine including

a measuring apparatus as claimed in Claim 52;

an engine management apparatus including a comparator arranged to receive a signal indicative of a measured value of a quantity related to torque in a drive shaft of the engine from the measuring apparatus, the comparator being preprogrammed to compare said measured value with a standard value of said quantity related to torque to generate a control signal, the engine management apparatus being responsive to said control signal to control an operating function of the engine.--

--70. (Previously Presently) An engine as claimed in Claim 69 in which said operating function of the engine is at least one of ignition timing when the engine is a spark ignition engine, injector pump timing when said engine is a diesel engine, boost pressure when said engine is turbocharged or supercharged.--

--71. (Previously Presented) An engine as claimed in Claim 70 in which the said engine management apparatus is preprogrammed to calibrate the measuring apparatus in respect of datum time periods when the engine is operated under a no load condition.--

--72. (New) A method as claimed in Claim 37 in which preprogramming said processor includes preprogramming it to employ appropriate Fast Fourier Transforms for said ameliorating the effects of vibrations and resonances.--

--73. (New) A measuring apparatus as claimed in Claim 52 in which preprogramming said processor includes preprogramming it to employ appropriate Fast Fourier Transforms for said ameliorating the effects of vibrations and resonances.--